UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
OSB2000-0282

January 23, 2001

Mr. Robert E. Willis
U.S. Army Corps of Engineers
Environmental Resources, CENWP-PM-E
P.O. Box 2946
Portland, OR 97208-2946

Re: Endangered Species Act, Section 7 Formal Consultation and Essential Fish Habitat Consultation on Four Fish Passage Alternatives at Elk Creek Dam, Rogue River, Jackson County, Oregon

Dear Mr. Willis:

The National Marine Fisheries Service (NMFS) has reviewed the Army Corps of Engineers (COE) request for Section 7 consultation under the Endangered Species Act (ESA) on the effects of four fish passage alternatives at Elk Creek Dam, Jackson County, Oregon. In addition, even though the COE did not request Essential Fish Habitat (EFH) consultation under the Magnuson-Stevenson Act, the NMFS has also conducted and concluded consultation on EFH on all four alternatives.

The four alternatives (projects) are described in the information provided by the COE request for consultation on September 1, 2000. The COE determined that the proposed projects may affect Southern Oregon/Northern California coho salmon (*Oncorhynchus kisutch*) under the ESA, and would be likely to adversely affect the species or its critical habitat. The NMFS also concluded from the ESA request that the projects may adversely affect EFH for coho salmon and chinook salmon (*O. tschawytscha*). The NMFS is consulting under the authority of the section 7(a)(2) of the ESA and its implementing regulations, 50 CFR Part 402, and the Magnuson-Stevens Act section 305 (b)(2) and implementing regulations, 50 CFR Part 600.

Enclosed is the biological opinion (Opinion), incidental take statement, and EFH consultation for the proposed projects. This Opinion constitutes formal ESA consultation for the Southern Oregon/Northern California coho salmon that may occur in the project vicinity. Southern Oregon/Northern California coho salmon were listed as threatened under the ESA by NMFS on May 7, 1997 (62 FR 24588). Critical habitat was designated for the Southern Oregon/Northern California coho salmon on May 5, 1999 (63 FR 13347), and includes the current fresh water range within the Rogue River Basin below long standing naturally impassable barriers. Critical habitat consists of the water, substrate, and adjacent riparian zone.

This Opinion also constitutes formal consultation under section 305 (b)(2) of the Magnuson-Stevens Act, which requires that Federal agencies which authorize, fund or undertake any action which may adversely affect any EFH are required to consult with the NMFS in order to receive recommendations on measures necessary to conserve and enhance EFH. The Pacific Fishery Management Council (PFMC), under Appendix A to Amendment 14 of the Pacific Coast Salmon Plan, approved EFH for coho salmon and chinook salmon on September 27, 2000. Salmon EFH includes all those streams, lakes, ponds, wetlands, and other water bodies currently or historically accessible to salmon in Washington, Oregon, Idaho, and California, except above impassable barriers identified by PFMC. Salmon EFH excludes areas upstream of longstanding naturally-impassable barriers (i.e., natural waterfalls in existence for several hundred years).

At the request of the COE, NMFS evaluated four alternatives designed to provide for fish passage past the partially completed Elk Creek Dam. The NMFS concludes in this Opinion that one of the proposed alternatives (dam breaching) is not likely to jeopardize the continued existence of the subject species or destroy or adversely affect its critical habitat, or adversely affect EFH. The NMFS further concludes in this Opinion that three of the proposed alternatives (existing trap and haul facility, existing diversion tunnel, and new trap and haul facility) are likely to jeopardize the continued existence of the subject species or destroy or adversely affect its critical habitat, and adversely affect EFH. However, since one of the proposed alternatives is non-jeopardy, there is no need to include in this Opinion a reasonable and prudent alternative to the three jeopardy alternatives (i.e., the Corps has already proposed an alternative with dam breaching). Pursuant to Section 7 of the ESA, for the non-jeopardy alternative, NMFS included reasonable and prudent measures (RPMs) with non-discretionary terms and conditions that NMFS believes are necessary and appropriate to minimize the potential for incidental take associated with this project.

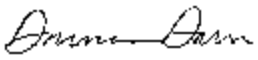
In this Opinion, the NMFS further includes EFH conservation recommendations which are required to mitigate adverse affects associated with the proposed alternatives. Due to adverse affects to coho and chinook salmon and inadequate provisions for fish passage, the new trap and haul facility, existing trap and haul facility, and the diversion tunnel alternatives cannot be mitigated through conservation recommendations. As a result, the NMFS recommends that these alternatives not be considered as viable alternatives. The dam breaching alternative will also create adverse affects for coho and chinook salmon; however, the proposed RPMs will provide appropriate conservation recommendations to mitigate effects.

The existing trap and haul system is currently being used to pass adult salmonids upstream past the project. Although the system allows some passage above the otherwise impassable Elk Creek Dam, operation of the system results in some direct take of listed SONC coho salmon, thus requiring an ESA section 10 permit. The current permit (Permit 1177) was issued on October 15, 1998, by NMFS, and expired on June 30, 2000 (NMFS 1998). The permit was extended to June 30, 2001, in a June 30, 2000, letter from NMFS. Because all four alternatives proposed by the Corps include continued operation of the existing trap and haul for some time, NMFS proposes to

extend the permit through 2003. This proposed action by NMFS is also addressed in the attached Opinion, thus NMFS is also an action agency.

Questions regarding this letter should be directed to Frank Bird (541-957-3383) or Lance Smith (503-231-2307) of my staff in the Oregon State Branch Office.

Sincerely,



Donna Darm
Acting Regional Administrator

cc: Ron Garst (USFWS, Portland)
Tom Satterthwaite (ODFW, Grants Pass)
Mike Evenson (ODFW, Central Point)

Endangered Species Act Section 7 Consultation

BIOLOGICAL OPINION

&

Magnuson-Stevens Act
Essential Fish Habitat Consultation

Effects of Four Fish Passage Alternatives (Corps)
and Extension of Section 10 permit (NMFS)
at Elk Creek Dam on Southern Oregon/Northern California Coho Salmon,
Southern Oregon/Northern California Coho salmon Critical Habitat, and
Klamath Mountains Province Steelhead,
Jackson County, Oregon

Agency: U.S. Army Corps of Engineers, National Marine Fisheries Service

Consultation
Conducted By: National Marine Fisheries Service
Northwest Region

Date Issued: January 23, 2001

Refer to: OSB2000-0282

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1. ENDANGERED SPECIES ACT

1.1. Background

This responds to the U.S. Army Corps of Engineers' (Corps) September 1, 2000, letter and biological assessment (BA; COE 2000a) requesting consultation on the effects of the proposed fish passage alternatives at Elk Creek Dam in the Rogue Basin in Southwest Oregon, on Endangered Species Act (ESA) listed Southern Oregon/Northern California coho salmon (SONC coho) (*Oncorhynchus kisutch*) and their designated critical habitat, and Klamath Mountains Province (KMP) steelhead (*O. mykiss*), a candidate species. The consultation initiation letter was received by the National Marine Fisheries Service (NMFS) on September 5, 2000. In addition, although the Corps did not request consultation on the effects of the four alternatives on Essential Fish Habitat (EFH) for either coho salmon or chinook salmon (*O. tschawytscha*), EFH for these species will be evaluated and conservation recommendations provided as needed in this consultation document. The EFH discussion occurs at the end of this document, separate from the ESA consultation.

SONC coho salmon were listed as threatened under the ESA on May 6, 1997 (62 FR 24588, May 6, 1997) and occur in the mainstem Rogue River and Elk Creek. Critical habitat for SONC coho salmon was designated May 5, 1999 (64 FR 24049). KMP steelhead were designated as candidate species on March 19, 1998 (63 FR 13347), and occur throughout the Rogue River Basin, including Elk Creek. Southern Oregon/Northern California Coastal chinook salmon were declared not warranted for listing under the ESA on September 16, 1999 (64 FR 50394), and occur throughout the Rogue River Basin and Elk Creek. EFH for coho salmon and chinook salmon was approved by the Secretary of Commerce on September 27, 2000 (pending FR notice), and includes Elk Creek.

The Corps has proposed four alternatives to provide fish passage above Elk Creek Dam (Table 1), a partially completed dam located on Elk Creek 1.7 miles above its confluence with the Rogue River. The alternatives include: (1) Using the existing diversion tunnel as a modified passage structure; (2) using the current fish trap and haul facility for adult migrants; (3) using a new trap and haul facility for adult migrants; and (4) partial removal of the existing dam. The confluence of Elk Creek with the mainstem Rogue River is at river mile 152. Construction of the dam was halted by court order in 1987 after dam height reached 83 feet. The existing dam created a fish passage barrier for most upstream adult coho salmon migrants and a hazard for downstream migrant juvenile coho salmon. The purpose of the proposed action is to restore viable fish passage at the site.

A trap and haul system is currently being used to pass adult salmonids upstream past the project. This trap and haul system has been used with partial success since October 1992. Although the system allows some passage above the otherwise impassable Elk Creek Dam, operation of the system results in some direct take of listed SONC coho salmon, thus requiring an ESA section 10 permit. The current permit (Permit 1177) was issued on October 15, 1998, by NMFS, and expired on June 30, 2000 (NMFS 1998). The permit was extended to June 30, 2001, in a June 30, 2000, letter from NMFS. The section 7 consultation regarding the effects of granting the section 10 permit to the Corps was completed by NMFS on October 6, 1998. When NMFS issued the extension of the section 10 permit to June 30, 2001, reinitiation of consultation was

not necessary because the extension did not constitute a significant change. NMFS is proposing to extend the section 10 permit to allow the existing trap and haul program to continue through 2003. This additional extension is considered a significant change, thus reinitiation of section 7 consultation is required. The reinitiation of consultation for the proposed extension is considered part of the proposed action addressed in this biological opinion (Opinion), thus the analysis of effects is incorporated into this Opinion.

Table 1. Description, estimated cost, and approximate completion date for the four fish passage alternatives (COE 1999, COE 2000a, personal communication, Rock Peters, COE).

	ALTERNATIVES			
	1. Existing Trap and Haul Facility	**2. Existing Diversion Tunnel**	**3. New Trap and Haul Facility**	**4. Dam Breaching**
Description	The existing fish collection facility would be operated continuously from October 15 through May 1, except during holidays, to augment the existing diversion tunnel fish pass.	The existing diversion tunnel through the dam, originally intended to pass upstream and downstream migrants and used as a water bypass during construction, would be maintained as the sole fish pass structure.	The existing facility would be demolished and a more effective and robust weir and trap structure would be constructed in its place, following the Applegate and Toutle trapping facility models.	The proposed partial removal consists of complete removal of the spillway structure and existing trap and haul facility, partial removal of the dam embankment on the south side, and restoration of the Elk Creek channel.
Estimated Cost	Operational cost: ≈$150,000/year.	Operational cost: <$150,000/year.	Construction cost: ≈$8 million. High O & M costs.	Construction cost: ≈$7 million. Low O & M costs.
Completed By	Ongoing	October 2001	October 2005	October 2003

The objective of this Opinion is to determine whether the proposed alternatives at Elk Creek Dam are likely to: (1) Jeopardize the continued existence of threatened SONC coho salmon, and candidate KMP steelhead; and/or (2) result in the destruction or adverse modification of SONC coho salmon critical habitat.

1.2. Proposed Action

The proposed action will depend on which of the four alternatives described below is selected.

1.2.1. Existing Trap and Haul Facility

With this alternative, the existing facility would be used indefinitely to provide adult coho salmon and steelhead passage. The facility would be operational between October 15 and May 1 each year. The existing weir spans Elk Creek, providing a complete block to upstream adult migrants under all conditions except flow events which overtop the weir. The existing weir is constructed of 1.5 inch steel or aluminum pickets on three-inch centers inserted in a metal I-beam support structure embedded in a concrete bed spanning Elk Creek. The weir crowds those fish captured into a permanent trap facility located on the north bank of Elk Creek for collection and transport to spawning grounds above the dam. When flow is approximately 300 cubic feet per second (cfs) and the weir is free of debris and functional, the top of the pickets are about five feet above the surface of Elk Creek. The entrance of the fishway to the trap is on the north bank

of Elk Creek immediately downstream from the north end of the weir. The fishway is a concrete structure four feet wide and 40 feet long, extending approximately perpendicular to the north bank. A "V"-shaped fyke made of 1.5 inch round aluminum tubes, also spaced on three-inch centers, traps fish that pass upstream into the trap. Fish are held in a concrete holding pond that is six feet wide and 27 feet long. Water pumped from Elk Creek above the weir maintains a water depth of about four feet in the trap and pond at a rate of about 10 cfs. Water temperature in the trap is similar to that of Elk Creek, since the distance to the creek is less than 70 feet.

Adult fish are held in the trap's holding pond for a maximum of 30 hours. As part of normal operations, the trapped fish are crowded into a square four-foot well in the existing loading tower, which is then completely filled with water. Fish are crowded to the top of the tower, spilled down a U-shaped trough, and dropped about six feet into an aerated 300-gallon transport tank on a truck. Fish are transported approximately 0.6 miles above the dam and released in Elk Creek (Satterthwaite 1998). Fish are transported a minimum of twice daily during weekdays, and a minimum of once daily on weekends. Adult fish are held in the transport tank for a maximum of 45 minutes prior to release, depending on the number of fish, although the total transport and holding time is usually less. Fish are anesthetized using MS-222, evaluated for species, sex, fork length, and presence of marks, and placed in a recovery tank. The fish are then released following recovery. Fin clipped fish that are known to be hatchery fish are separated out. Prior to 1999, fish were also opercule-punched as a transport mark. Adult coho salmon with fin clips are not released upstream of Elk Creek Dam. Disposition of the hatchery fish follows the same procedures as employed for excess hatchery fish collected at the Cole Rivers Hatchery.

Downstream migrating fish (adults and juveniles) pass either through the diversion tunnel or over the partially completed spillway during flooding. In a typical year, debris builds up on the trash racks in front of the upstream end of the diversion tunnel. In addition, trash passing the dam also builds up on the fish weir, affecting its efficiency. It is very difficult to clean the debris from either structure. As a result, downstream migrants passing through the diversion tunnel or over the dam spillway and through or over the weir are subjected to potential hazards associated with the debris buildup during high flow events.

1.2.2. Existing Diversion Tunnel

In this alternative, an existing diversion tunnel within the dam would be the sole upstream fish passage facility. The tunnel is 359 feet long by eight feet wide, with a 3% slope and flows approaching 10 feet/second. The tunnel would be left in its current condition and location. After inspecting the tunnel, this alternative would be ready in time for the next adult SONC coho salmon migration season in late 2001. The diversion tunnel contains 10 retrofit metal weirs three feet high by eight feet wide, with a central crest notch about one foot square. These weirs were designed to facilitate upstream adult salmonid passage. The trap and haul facility, including the weir within Elk Creek, would be abandoned and removed, and the adjacent stream and banks restored to a natural configuration and condition. Any downstream fish movement would be over the dam spillway or through the tunnel and entirely through the tunnel for upstream migrants.

1.2.3. New Trap and Haul Facility

In this alternative, the existing fish trap and collection facility would be demolished and a more effective weir and trap structure would be constructed in its place. The existing trap and haul facility would continue to be used in the meantime. Assuming that: Congress directs the Corps to implement this alternative in the 2002 appropriations; preparation by the Corps takes 1.5 - 2 years; and contracting and construction takes 1 -2 years, this alternative is estimated to be completed by October 2005 (personal communication, Rock Peters, COE). For purposes of this Opinion, NMFS assumes this alternative will be completed by October 2005. Thus under this option, the existing trap and haul facility would continue to be used for adult SONC coho salmon for another four seasons (2001-2004).

Based on information submitted by the Corps, the design of the proposed new structure would be a combination of the Toutle River and Applegate trapping facilities, which are designed to prevent upstream passage and trap all migrating adults (COE 1971). The documents submitted by the Corp describing this alternative are insufficient to fully analyze the effects of the action on fish passage. As a result, a very conservative analysis was conducted. The facility would consist of a concrete velocity barrier constructed at the downstream end of the existing stilling basin, a fish ladder designed to reflect local topography and flows, a collection pool, a holding pool, sorting facilities, and a fish transfer facility (COE 1987). Operationally, the weir would act as velocity barrier and deflect upstream migrating adult fish into the fish ladder structure. An approach pool and entrance pool would lead the fish to the ladder, which ends in a collection pool. Brails would be used in the collection pool to control the number of fish entering the sorting facility. Fish would be crowded into a chute leading to the holding/transfer pool. Fish placed in the transfer pool would be hoisted and chuted into the transfer truck for upstream release. Downstream migrating adult and juvenile fish would be able to pass unimpeded over the weir at any flow and no active management would be required.

The new trap and haul facility and velocity barrier weir would replace the existing trap and haul and picket weir facility in that location. As a result, the existing fish collection structure on the north bank and the weir structure spanning Elk Creek below the dam would be deconstructed prior to construction of the new facility and the new north bank fish collection facility and associated velocity barrier weir constructed in its place.

Both deconstruction and construction would require creating an Elk Creek bypass to minimize instream effects during the work period, which would entail using the existing diversion tunnel with an associated channel bypass. In addition, extensive instream work would be required at the weir site for removal of the old weir and construction of the new weir.

1.2.4. Dam Breaching

The partial dam removal alternative proposes to remove a portion of the roller compacted concrete dam and spillway structure and realign the Elk Creek channel to its original alignment and gradient for the purpose of restoring fish passage through the project area. The existing trap and haul facility would continue to be used until breaching is completed. The Corps estimates that this alternative would be completed by October 2003 (personal communication, Rock Peters, COE). For purposes of this Opinion, NMFS assumes this alternative will be completed by October 2003. Thus under this option, the existing trap and haul facility would continue to be used for adult SONC coho salmon for another two seasons (2001-2002).

According to the BA, the project will be carried out in the following four steps: (1) Worksite preparation; (2) care and diversion of water; (3) demolition of concrete structures; and (4) site grading, bank protection, and demobilization. Water quality will be monitored throughout and after the project. Rerouting the stream through the dam will require demolition of approximately 50,000 cubic yards (cy) of roller compacted concrete and approximately 15,000 cy of conventional concrete. Realignment of the stream and local grading will require approximately 275,000 cy of cut and fill and approximately 1,000 cy of rock excavation. The length of affected stream is approximately 5,000 feet. Bank protection may be required and may include as much as 5,000 cy of revetment. Revegetation for slope stability and streambank erosion control is also included in the proposed action.

The design will provide a fish passage corridor in a stream that is geomorphically balanced as much as is reasonably possible immediately following construction. In stream design features such as rock weirs would maintain water velocities in ranges acceptable for passage of anadromous fish. The plan would also utilize a portion of the existing tailrace to create a backwater area. This backwater would provide over-winter habitat for juvenile coho salmon. Design criteria provide both upstream and downstream fish passage, under all conditions, with no more than a three day delay or no more than 100 hours total delay during a migration season. An upper target of 5000 cfs has been selected as the flow below which both juvenile and adult coho salmon moved within Elk Creek. The lower limit is 10 cfs for upstream passage and less than one cfs for downstream passage, based on gauged flow records. Design velocities will follow conservative guidelines established by ODFW and Washington Department of Fish and Wildlife.

All reaches in the channel will have a zone in which velocities are in the range of 0-3 feet/second at flows below 5000 cfs. Other design criteria include: a minimum depth of 9-inches for all flows during the migration season, no hydraulic jumps across an entire cross-section, no short-circuiting of channel through subsurface flow, no ponding above the structure at or below 5000 cfs, creating a natural bed profile and structure through the dam cut section, and providing resting areas for upstream migration in critical velocity zones. In addition to structural modifications of the dam and channel, selected gravel bars will be seeded with a 2-3 foot thick layer of a gravel/cobble mixture ranging from 76 mm-460 mm in diameter to provide material for bar establishment and riparian growth downstream.

1.2.5. Extension of Section 10 Permit

An additional purpose of this consultation is to determine whether the NMFS action of extending the section 10(a)(1)(A) scientific research/enhancement permit to the Corps (Permit 1177) for an annual take of adult and juvenile SONC coho salmon is likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of the species' designated critical habitat. The permit will continue to cover the Corps' trap and haul program at Elk Creek Dam through 2003. In addition, the permit will continue to authorize an annual take of ESA-listed adult and juvenile coho salmon associated with scientific monitoring activities that will include snorkel surveys and the collection and handling of adult coho salmon carcasses to assess the species' natural production upstream of Elk Creek Dam.

1.3. Biological Information and Critical Habitat

A description of the life history, biology and biological requirements for SONC coho salmon, SONCC chinook salmon and KMP steelhead can be found in Spence et al. (1996), Weitkamp et al. (1995), Busby et al. (1996), and Busby et al. (1994). Based on the best available information on fish presence within Elk Creek (ODFW), the NMFS expects that few adult or rearing SONC coho salmon, SONCC chinook salmon or KMP steelhead would be present in the action area during any of the proposed in-water work periods for the alternatives. All proposed actions would occur within designated SONC coho salmon critical habitat (64 FR 24049) and described coho and chinook salmon EFH (PFMC 1999).

The "action area" is defined as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." (50 CFR 402.02). Physical activities associated with all four alternatives, such as operating the trap and hauling fish around the dam (or breaching the dam) encompass the immediate area around Elk Creek Dam and the road between the Rogue River and the dam along lower Elk Creek. In addition, because of the location of the dam less than three miles from the mouth of Elk Creek (i.e., below all fish-bearing tributaries of Elk Creek) and the dam's effects on fish passage, all four alternatives affect the entire watershed because they influence fish passage to and from spawning habitat in the mainstem of Elk Creek and its tributaries. This action area also applies to EFH, as described below.

The action area within the context of EFH is defined by Amendment 14 of the Pacific Coast Management Plan (1999) as "any activity that may adversely affect EFH, regardless of its location." This area serves as a migratory corridor for both adult and juvenile life stages of coho salmon, chinook salmon and steelhead. Essential features of the adult and juvenile migratory corridor for the species are: (1) Substrate, (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food (juvenile only), (8) riparian vegetation, (9) space, and (10) safe passage conditions (50 CFR Part 226). The essential features these proposed fish passage alternatives may affect are substrate, water quality, water velocity, and safe passage conditions. These features are also important for chinook salmon and steelhead, which overlap that of coho salmon within Elk Creek. In addition, these features are components of coho and chinook salmon EFH, as described in PFMC (1999).

1.4. Evaluating Proposed Actions

The standards for determining jeopardy are set forth in Section 7(a)(2) of the ESA as defined by 50 C.F.R. Part 402 (the consultation regulations). NMFS must determine whether the action is likely to jeopardize the listed species and/or whether the action is likely to destroy or adversely modify critical habitat. This analysis involves the initial steps of: (1) Defining the biological requirements of the listed species, and (2) evaluating the relevance of the environmental baseline to the species' current status.

Subsequently, NMFS evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NMFS must consider the estimated level of mortality attributable to: (1) Collective effects of the proposed or continuing action, (2) the environmental baseline, and (3) any cumulative effects. This evaluation must take into account measures for survival and recovery specific to the listed salmon's life stages that occur beyond the action area. If NMFS

finds that the action is likely to jeopardize, NMFS must identify reasonable and prudent alternatives for the action.

Furthermore, NMFS evaluates whether the action, directly or indirectly, is likely to destroy or adversely modify the listed species' critical habitat. The NMFS must determine whether habitat modifications appreciably diminish the value of critical habitat for both survival and recovery of the listed species. The NMFS identifies those effects of the action that impair the function of any essential feature of critical habitat. The NMFS then considers whether such impairment appreciably diminishes the habitat's value for the species' survival and recovery. If NMFS concludes that the action will adversely modify critical habitat, it must identify any reasonable and prudent measures available.

For the proposed action, NMFS' jeopardy analysis considers direct or indirect mortality of fish attributable to the action. NMFS' critical habitat analysis considers the extent to which the proposed action impairs the function of essential elements necessary for migration, spawning, and rearing of the listed and proposed species under the existing environmental baseline.

1.4.1. Biological Requirements

The first step NMFS takes when applying the ESA section 7(a)(2) to listed salmon is to define the species' biological requirements that are most relevant to each consultation. NMFS also considers the current status of the listed species, taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NMFS starts with the determinations made in its decision to list the species for ESA protection, and also considers new data available that is relevant to the determination (Weitkamp et al. 1995, Myers et al. 1998).

The relevant biological requirements are those necessary for SONC coho salmon to survive and recover to a naturally reproducing population level sufficient to make protection under the ESA unnecessary. These requirements are essentially the same for SONCC chinook salmon and KMP steelhead. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance its capacity to adapt to environmental conditions, and allow it to become self-sustaining in the natural environment.

For this consultation, NMFS finds that the biological requirements of the SONC coho salmon ESU are best expressed in terms of environmental factors that define properly functioning freshwater aquatic habitat necessary for survival and recovery of the ESU. Individual environmental factors include water quality, habitat access, physical habitat elements, channel condition, and hydrology. Properly functioning watersheds, where all of the individual factors operate together to provide healthy aquatic ecosystems, are also necessary for the survival and recovery of SONC coho salmon, as well as for maintaining healthy populations of SONCC chinook salmon and KMP steelhead.

1.4.2. Environmental Baseline

This section begins with a description of the status of anadromous salmonids under the environmental baseline within the Elk Creek watershed in sections 1.4.2.1 through 1.4.2.3. This

is followed by a description of the habitat baseline for anadromous salmonid habitat within the Elk Creek watershed in section 1.4.2.4.

1.4.2.1. Status of listed SONC Coho Salmon

The status of the listed SONC coho salmon ESU is described below, first for the ESU as a whole in section 1.4.2.1.1, and then within the Elk Creek watershed in section 1.4.2.1.2.

1.4.2.1.1. Range-wide status

NMFS described the population status of the SONC coho salmon ESU in its status review (Weitkamp et al. 1995) and in the SONC coho salmon final listing rule (62 FR 24588, May 6, 1997). The fish counts at Gold Ray Dam (28 miles downstream on the mainstem Rogue River at river mile 126) provide the best quantitative source of information available on SONC coho salmon abundance in the upper Rogue River Subbasin, and may also provide an indicator of population trends of this ESU as a whole. In the seven year period from 1993 to 1999, counts of adult SONC coho salmon at Gold Ray Dam have ranged from 756 in 1993 to 4,566 in 1997 (COE 2000b). Data from these seven years is given for comparison with the data available over this time period for the SONC coho population in the Elk Creek watershed (Table 2 below)

1.4.2.1.2. Current status in Elk Creek watershed

SONC coho salmon adults returning to Elk Creek have been closely monitored since the installation of a trap-and-haul facility at Elk Creek Dam in 1992. The seven year average (1993 to 1999) of SONC coho salmon adults returning to the damsite was 15.6 percent (76-982 fish) of the annual SONC coho salmon adults counted going over Gold Ray Dam 28 miles downstream on the mainstem Rogue River (756-4,566 fish). In the most recent 3 year period for which data are available (1997-1999), adult SONC coho returns to Elk Creek Dam averaged 24.2 percent of the Gold Ray returns (Table 2). Satterthwaite and Leffler (1997) summarized returns and monitored SONC coho salmon spawning distribution above the damsite by counting redds and determining presence/absence of coho salmon fry. Coho salmon redds and fry were found in Elk Creek and four of the five tributaries that were surveyed above the damsite, indicating wide distribution of coho salmon adults.

Table 2. Counts of adult SONC coho salmon (wild fish as identified by ODFW) at Gold Ray and Elk Creek Dams, 1993-1999 (COE 2000b).

Year (counts from 9/15-1/31)	SONC coho (wild) at Gold Ray Dam	SONC coho (wild) at Elk Creek Dam	% of Gold Ray fish at Elk Creek Dam
1993-94	756	76	10.1
1994-95	3,265	232	7.1
1995-96	3,345	349	10.4
1996-97	3,516	319	9.1
1997-98	4,566	982	21.5

1998-99	1,310	404	30.8
1999-2000	1,468	298	20.3

Historically, the Elk Creek watershed was of great importance to coho salmon as a much larger proportion of Rogue River Basin coho spawned in this watershed than represented by the relative size of the watershed. For example, USFWS (1956) redd surveys conducted from 1949 to 1955 reported a maximum annual coho redd count of 1,469 redds in the upper Rogue River Subbasin (2,601 redds for the entire Rogue River Basin), while the maximum annual coho redd count for the Elk Creek watershed was 764 redds, or over half for the subbasin and approximately one third of the total for the entire basin. The Elk Creek watershed represents only about three percent of the total area within the Rogue River Basin. Similarly, in a report to the Corps of Engineers in 1961 regarding fish and wildlife resources that would be lost from the construction of dams in the Rogue River Basin, USFWS stated "approximately 3,600 coho salmon enter Elk Creek annually and spawn above Elk Creek damsite. These comprise more than one-third of the entire spawning population of coho salmon in Rogue River basin." (USFWS 1961).

Based on the best information available on the current status of the SONC coho salmon (Weitkamp 1995), the information available regarding population status, population trends, and genetics (Weitkamp 1995), and the poor environmental baseline conditions within the action area (COE 2000a), NMFS concludes that not all of the biological requirements of SONC coho salmon within the action area are currently being met under the environmental baseline.

1.4.2.2. Status of KMP Steelhead

KMP steelhead are a candidate species for listing hence their status within the action area is provided here. KMP steelhead are well distributed within Elk Creek, with two races present in the watershed (summer and winter), and have been closely monitored concurrently with the SONC coho salmon. Chilcote (1998) concluded that upper Rogue River steelhead populations, which includes those in Elk Creek, were self-sustaining. Surveys conducted in 1999 as part of the ODFW KMP Steelhead Project determined that juvenile steelhead were present in 95 of 98 randomly selected sample sites in the upper Rogue River Basin. As of April 20, 2000, the ODFW does not consider the runs to be threatened, although the effects of Elk Creek Dam on that subpopulation are apparent. Pre-dam construction populations in Elk Creek are estimated to be 3,000 adult steelhead, while current estimates indicate Elk Creek steelhead returns for the period 1992-1999 range from 105-493 adult migrants (1.3 percent - 4.4 percent of the population of steelhead passing Gold Ray Dam during the same period). Current returns represent approximately a 10 fold drop from pre-dam levels.

Based on the best information available on the current status of the KMP steelhead (Chilcote 1998), the information available regarding population status, population trends, and genetics (Busby 1994; Chilcote 1998), and the poor environmental baseline conditions within the action area (COE 2000a), NMFS concludes that not all of the biological requirements of KMP steelhead within the action area are currently being met under the environmental baseline.

1.4.2.3. Status of SONCC Chinook Salmon

Although SONCC chinook salmon are not warranted for listing under the ESA, they must be evaluated under EFH rules since they are a fishery resource covered by the Magnuson-Stevenson Act. SONCC chinook salmon are less well distributed in Elk Creek than other salmonids, but based on their low numbers (11 adults/24 jacks transported in 1996; 35 adults/4 jacks transported in 1997), they are present in sufficient quantities to be considered present. This also means that Elk Creek must be considered EFH for this species.

Based on the best information available on the current status of the SONCC chinook salmon (Meyers et al. 1998), the information available regarding population status, population trends, and genetics, and the poor environmental baseline conditions within the action area (COE 2000a), NMFS concludes that not all of the biological requirements of SONCC chinook salmon within the action area are currently being met under the environmental baseline.

1.4.2.4. Anadromous Salmonid Habitat Baseline

The habitat baseline for anadromous salmonids in the Elk Creek watershed is described in the joint Rogue River National Forest and Medford BLM watershed analysis report (RRNF & MBLM 1996), and summarized below.

A number of human activities within the watershed during the 20th century, such as the construction and use of roads within floodplains, have tended to create straightened channels. This loss of complex structure within streams has resulted in an overall increase in the velocity and quantity of water flows during and shortly after storm events because of the relative lack of resistance to water movement. Consequently, the streams in the watershed have substantially reduced densities of large woody debris, and their channels have downcut through alluvial substrate to bedrock, thus becoming confined to a single channel and disconnected with their floodplains even during high water. This channel simplification trend has also resulted in substrate coarsening as the more rapidly moving stream transports larger material downstream (RRNF & MBLM 1996).

Large-scale alterations and removal of riparian vegetation have occurred in the watershed through harvest of overstory conifer trees, road building, grazing, and rural developments. This loss of large trees within the riparian areas has collectively caused a reduction in the amount and distribution of streamside shade, large wood, and streambank stability. These changes have significantly contributed to degradation of aquatic habitat through warmer water temperatures, simpler channels, and greater streambank erosion, respectively (RRNF & MBLM 1996).

The watershed's hydrology, or the way in which water is captured, stored, and released has been altered in the Elk Creek watershed as a result of cumulative past human activities, primarily related to road building, timber harvesting, grazing, and rural development. These activities have resulted in increased stream temperatures (five streams in the watershed are listed as "water quality limited" by the Oregon Department of Environmental Quality), occasional peaks in turbidity above natural rates, and increased rates and quantities of runoff and soil transport during and after storm events. The cumulative effects associated with past human activities have resulted in a limited amount of high quality, well-distributed anadromous salmonid habitat in the

Elk Creek watershed (RRNF & MBLM 1996). The resulting current environmental baseline is summarized in the left-hand portions of the tables in the section 1.5 below.

1.5. Analysis of Effects

The descriptions of the action area and the spatial and temporal scales of analysis used in this Opinion are given below in section 1.5.1. The effects of each of the four alternatives are described in section 1.5.2.

1.5.1. Action Area and Scales of Analysis

The "action area" is defined as "all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action." (50 CFR 402.02). Physical activities associated with all four alternatives, such as operating the trap and hauling fish around the dam (or breaching the dam) encompass the immediate area around Elk Creek Dam and the road between the Rogue River and the dam along lower Elk Creek. In addition, because of the location of the dam less than three miles from the mouth of Elk Creek (i.e., below all fish-bearing tributaries of Elk Creek) and the dam's effects on fish passage, all four alternatives affect the entire watershed because they influence fish passage to and from spawning habitat in the mainstem of Elk Creek and its tributaries. This action area also applies to EFH, as described below.

In this Opinion, USGS's hierarchical system of hydrologic unit codes (HUC) is used. This system classifies drainages of different sizes, the largest and 2nd largest of which are called "regions" and "subregions" (e.g., Pacific Northwest and Columbia River drainage, respectively). Subregions are divided into the 3rd largest unit and called "basins" (e.g., Rogue River Basin), which are then divided into "4th field HUCs" called "subbasins" (e.g., upper Rogue River Basin). The subbasins are further divided into "5th field HUCs" and called "watersheds" (e.g., the Elk Creek watershed), and "6th field HUCs" and called "subwatersheds" (UO 1998).

Anadromous salmonids were or are distributed across large areas in western North America and divided into "evolutionarily significant units" (ESUs) by NMFS. An ESU is a group of populations, and each population is defined by the subbasin or watershed in which it spawns (NMFS 1991, Waples 1991). The combination of spawning area fidelity and limited gene flow among spawning areas causes populations to become uniquely adapted over time to the conditions in a particular subbasin or watershed (Groot and Margolis 1991). NMFS has not defined populations within the SONC coho salmon ESU. However, in the development of its Viable Salmonid Population concept, NMFS (2000) identified four populations each within the Upper Columbia chinook salmon and Upper Columbia steelhead ESUs (Wenatchee, Entiat, Methow, and Okanagon subbasins). These Upper Columbia ESU populations are delineated by subbasins (4th field HUCs), which is also the spatial scale most commonly used by ODFW to define populations of anadromous salmonids.

The Elk Creek watershed is a 5th field HUC within the Upper Rogue River Subbasin, a 4th field HUC. The Upper Rogue River Subbasin is delineated by the U.S. Geological Survey as the portion of the Rogue River Basin upstream of the Little Butte Creek - Rogue River confluence (USGS 2000). About one-third of this subbasin is blocked to anadromous salmonids by Lost Creek Dam, but the habitat upstream of the damsite historically produced very few coho salmon

(USFWS 1956). As noted above, downstream of the damsite within this subbasin, coho salmon were historically produced mostly from Little Butte Creek, Trail Creek, and Elk Creek, with Elk Creek being the most productive watershed. For example, in the early 1950s, USFWS's largest annual coho redd counts for the Upper Rogue Basin totaled 1,469 redds, with 764 (52 percent) in the Elk Creek watershed. USFWS (1961) further reported that of the approximately 3,600 adult salmon returning to the entire Rogue Basin (3rd field HUC), about one-third spawned in the Elk Creek watershed. In addition, from 1997-99, in spite of the fish passage problems at Elk Creek Dam and the degradation of habitat that has occurred due to the construction of the dam, about one-quarter of the adult SONC coho returning to the upper Rogue River Subbasin were bound for the Elk Creek watershed (COE 2000b). Thus, this Opinion considers the Elk Creek watershed as the appropriate scale for the jeopardy analysis, even though it is a 5th field watershed rather than a 4th field subbasin, due to its importance for SONC coho salmon at the subbasin scale.

Healey and Prince (1995) argue that the appropriate conservation unit for anadromous salmonids is the population and its habitat because maintaining genetic (genotype) and morphological, physiological, and behavioral (phenotype) diversity depends on subbasin-scale habitat diversity and the population's ability to use it. That is, the full genetic variability within a population is not physically expressed without the full range of habitat diversity historically found in anadromous salmonid subbasins. This supports ODFW's designation of subbasin-scale populations of anadromous salmonids, while emphasizing the importance of suitable and diverse habitat at this scale.

In addition to spatial scale, the temporal scale for the species-specific jeopardy analyses in this Opinion must also be defined. That is, over what time frame shall the effects of the action be considered for each species? This is an important consideration because the longer the time frame for an adverse effect action such as this one, the more harmful the aggregate effects of the action are likely to be on the affected species. This is particularly true if the proposed action will continue for multiple generations of the species over most or all of its range.

The temporal scale, or time frame, over which the effects of the proposed action are analyzed influences the severity of the effects. For example, analyzing the effects of alternative one of the proposed action on SONC coho salmon over a single year would produce a different result than analyzing the effects over 100 years (equivalent to dozens of coho generations). When considering the ongoing effects of projects built before ESA listings, temporal scale is especially important because there is no construction period during which effects are concentrated over the short term as species are forced to quickly adapt to the new environmental conditions. The effects of ongoing projects are less dramatic over the short term but may have major impacts to a listed species over the long term.

The temporal scale for this consultation is influenced by two factors: (1) The temporal scales of the habitat indicators considered in the effects section below; and (2) the time frame for which the COE has requested consultation on the proposed action. The habitat indicators (e.g., water quality, sediment, large woody debris, peak/base flows) used in the Effects section provide the framework for the analysis of effects in this Opinion, thus the temporal scales they operate on point to the appropriate temporal scale for the analysis of effects. Water temperature dynamics, sediment/large wood transport and deposition, and flow regime are largely annual processes dependent on seasonal cyclic conditions, whereas the creation and maintenance of deep pools

and off-channel habitat depend on disturbance events such as flooding that occur every few years and are thus decadal processes (recurrence interval of 10-100 years). The functions of riparian vegetation and floodplains, and some aspects of water quality such as nutrient cycling, are continual process with less (but still some) seasonal variation. For example, streambank stabilization by living and dead riparian vegetation is most functional during the high flow season.

The COE has requested consultation on the effects of the four alternatives over the next ten to 50 years. A time frame consistent with the annual to decadal temporal scales of the relevant habitat indicators in the Elk Creek watershed is one decade. Hence, this Opinion will attempt to determine the likely effects of the proposed alternatives within the Elk Creek watershed over the next ten years.

1.5.2. Effects of Proposed Action

The environmental baseline of habitat within the action area (section 1.4.2.4 above) and the effects of the action on this baseline are organized and summarized in this Opinion at the appropriate spatial and temporal scales with a NMFS habitat-based evaluation method (NMFS 1996), based on information from the BA (COE 2000a) and the other sources cited in the Opinion. This forms the basis for the determination of effects and the jeopardy analysis. The effects of each of the four alternatives are expressed in terms of the expected effect (restore, maintain, or degrade) on each of 18 aquatic habitat indicators in the project area at the appropriate spatial and temporal scales, as summarized in the checklists below (Tables 3-6) completed for each of the four alternatives. These effects evaluations are considered sufficient for the EFH analysis given at the end of this Opinion.

1.5.2.1. Existing Trap and Haul Facility

As shown in Table 1 above, Alternative One for the proposed action is the continued use of the existing trap and haul facility annually from October 15 through May 1 throughout the temporal scale considered in this Opinion (i.e., next ten years). The trap would be operated daily except during holidays, to augment any fish passage that may be occurring in the existing diversion tunnel at the base of the dam. The results of the completed checklist for this alternative are shown below in Table 3. The continued presence of the partially completed dam in the stream channel will continue to degrade habitat elements (e.g., large woody debris) and channel conditions (e.g., floodplain connectivity) because the dam blocks the passage of at least some large wood and sediment. However, less than 3 miles of Elk Creek is downstream of the dam, plus this reach has few low gradient areas where hydrogeomorphic processes are most effective at sustaining habitat elements and channel conditions. Hence this degradation by the dam occurs at a smaller spatial scale than the Elk Creek watershed, so this alternative is not likely to degrade any of the habitat indicators at the watershed scale considered in this Opinion, with the exception of habitat access due to continued physical barriers to fish passage.

This alternative is expected to continue degrading habitat access because the continued operation of the existing trap and haul facility impacts adult and juvenile SONC coho migration due to the following problems: (1) Some adults refuse to enter the trap and go back downstream (trap rejection), or are hauled upstream of the dam and then fall back through the dam and are injured or killed either in the diversion tunnel and/or in the weir; (2) during high flows the weir is often

overtopped, allowing upstream migrating coho salmon adults to move above the weir, trapping them in the spill pool between the dam and weir, where they are likely to die; (3) migration of adult coho salmon is delayed by the trap and haul operation even when it runs smoothly, compared to natural conditions; (4) injury occurs in the trap and/or during hauling and handling; (5) spawning may be disrupted or displaced due to transport; (6) downstream migrating juveniles may be impinged on debris that clogs the diversion tunnel and weir during high spring flows, which may result in injury or death; and (7) debris carried by high flows may knock down or otherwise damage the weir, allowing adults to swim up into the tailrace where they are unable to spawn or continue migrating upstream.

While the existing trap and haul facility may sustain a small SONC coho salmon population within Elk Creek through capture and transport of adults above the dam, the harm and mortality induced by the trap and haul facility, as described above, constitutes a significant take of listed SONC coho salmon. ODFW records (1994-99) documented seven adult salmon mortalities associated with the trap and transportation over a period of six years, and delayed mortalities associated with the trap and haul program have been documented (COE 2000a). More importantly, the injury and mortality described in the above paragraph have been overlooked due to the difficulty in observing these effects, thus the overall impact of continuing to operate the existing trap and haul is likely greater than actually observed so far. Hence, the implementation of Alternative One is expected to result in significant take of SONC coho salmon at the spatial and temporal scales considered in this Opinion (i.e., within the Elk Creek watershed over a period of ten years) and will likely contribute to the eventual extirpation of SONC coho salmon from the Elk Creek watershed.

Table 3. Summary checklist of environmental baseline and likely effects of continuing to operate the existing Elk Creek trap and haul facility on relevant habitat indicators in the Elk Creek watershed over ten years.

	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
PATHWAYS: INDICATORS	Properly[1] Functioning	At Risk[1]	Not Properly[1] Functioning	Restore[1]	Maintain[1]	Degrade[1]
Water Quality: Temperature		X			X	
Sediment		X			X	
Chem. Contamination	X				X	
Habitat Access: Physical Barriers			X			X
Habitat Elements: Substrate			X		X	
Large Woody Debris			X		X	
Pool Frequency			X		X	
Pool Quality			X		X	
Off-channel Habitat			X		X	
Refugia			X		X	
Channel Condition: Width/Depth Ratio			X		X	
Streambank Condition			X		X	
Floodplain Connectivity			X		X	
Flow/Hydrology: Peak/Base Flows		X			X	
Drainage Network Increase		X			X	

Watershed Conditions: Road Density/Location			X		X	
Disturbance History			X		X	
Riparian Reserves		X			X	

[1] These three categories of function (properly functioning, at risk, and not properly functioning) and the three effects (restore, maintain, and degrade) are defined for each indicator in NMFS (1996).

1.5.2.2. Existing Diversion Tunnel

As shown in Table 1 above, Alternative Two for the proposed action is to use the existing diversion tunnel through the dam as the sole fish pass structure throughout the temporal scale considered in this Opinion (i.e., next ten years). The diversion tunnel was not originally intended to pass upstream and downstream migrants. The results of the completed checklist for this alternative are shown below in Table 4. As with Alternative One, the continued presence of the partially completed dam in the stream channel will continue to degrade habitat elements (e.g., large woody debris) and channel conditions (e.g., floodplain connectivity) because the dam blocks the passage of at least some large wood and sediment. However, less than 3 miles of Elk Creek is downstream of the dam, plus this reach has few low gradient areas where hydrogeomorphic processes are most effective at sustaining habitat elements and channel conditions. Hence this degradation by the dam occurs at a smaller spatial small scale than the Elk Creek watershed, so this alternative is not likely to degrade any of the habitat indicators at the watershed scale considered in this Opinion, with the exception of habitat access due to continued physical barriers to fish passage.

The use of the diversion tunnel as the sole adult coho salmon passage mechanism past Elk Creek Dam would constitute significant harm to SONC coho salmon over the temporal scale considered in this Opinion (ten years), as upstream passage would be denied to virtually all migrating adults. Upstream-migrating adult SONC coho salmon attempting to pass through the diversion tunnel would have a very narrow flow velocity window through which a small number of adults might gain upstream passage (personal communication, Rock Peters, COE). As a result, most adult SONC coho salmon would be prohibited from moving through the diversion tunnel to upstream spawning habitat and would be forced to remain below the dam to seek out what little spawning habitat they could find in lower Elk Creek, or return to the Rogue River and seek spawning habitat elsewhere.

According to the COE, some adult KMP steelhead manage to work through the diversion tunnel and spawn in upstream reaches. Downstream juvenile migrants of both species, including adult KMP steelhead moving back down the system, would be subjected to the diversion tunnel, its weir structures and debris, and associated extreme turbulence and obstacles. The action is expected to result in significant take of SONC coho salmon over both the short term (one year) and the temporal scale considered in this Opinion, and quickly result in the extirpation of SONC coho salmon from Elk Creek as well as the likely eventual extirpation of KMP steelhead from the system.

Table 4. Summary checklist of environmental baseline and likely effects of use of diversion tunnel for fish passage on relevant habitat indicators in the Elk Creek watershed over ten years.

	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
PATHWAYS: INDICATORS	Properly[1] Functioning	At Risk[1]	Not Properly[1] Functioning	Restore[1]	Maintain[1]	Degrade[1]
Water Quality: Temperature		X			X	
Sediment		X			X	
Chem. Contamination	X				X	
Habitat Access: Physical Barriers			X			X
Habitat Elements: Substrate			X		X	
Large Woody Debris			X		X	
Pool Frequency			X		X	
Pool Quality			X		X	
Off-channel Habitat			X		X	
Refugia			X		X	
Channel Condition: Width/Depth Ratio			X		X	
Streambank Condition			X		X	
Floodplain Connectivity			X		X	
Flow/Hydrology: Peak/Base Flows		X			X	
Drainage Network Increase		X			X	
Watershed Conditions: Road Density/Location			X		X	
Disturbance History			X		X	
Riparian Reserves		X			X	

[1] These three categories of function (properly functioning, at risk, and not properly functioning) and the three effects (restore, maintain, and degrade) are defined for each indicator in NMFS (1996).

1.5.2.3. New Trap and Haul Facility

As shown in Table 1 above, Alternative Three for the proposed action is to replace the existing trap and haul facility with a more effective and robust weir and trap structure. Construction of this new facility is estimated to be completed by October 2005 (personal communication, Rock Peters, COE), thus the existing trap and haul would be used in the meantime. According to the BA (COE 2000a), the new facility would be similar to the Applegate and Toutle trapping facility models. COE did not provide any additional information on the design of the new facility either in its BA or in follow-up discussions with NMFS. Nevertheless, the minimal information provided by COE constitutes the best available information for this alternative, and must be used by NMFS for determining the overall effects of the action on the environmental baseline within the action area.

As with Alternatives One and Two, the continued presence of the partially completed dam in the stream channel will continue to degrade habitat elements (e.g., large woody debris) and channel conditions (e.g., floodplain connectivity) because the dam blocks the passage of at least some large wood and sediment. However, less than 3 miles of Elk Creek is downstream of the dam,

plus this reach has few low gradient areas where hydrogeomorphic processes are most effective at sustaining habitat elements and channel conditions. Hence this degradation by the dam occurs at a smaller spatial small scale than the Elk Creek watershed, so this alternative is not likely to degrade any of the habitat indicators at the watershed scale considered in this Opinion, with the exception of habitat access due to continued physical barriers to fish passage (Table 5).

Alternative Three includes the construction, operation and maintenance of the new facility. Construction is likely to cause some sediment and turbidity effects in Elk Creek throughout the period the number of work seasons required due to in-water work necessary for existing weir and trap removal, construction of the new weir facility, and construction/removal of a bypass channel around the trap and haul facility during instream work. Turbidity would likely remain below the 10% above natural levels threshold imposed on the project. The combined effects of sediment and turbidity increases would only affect SONC coho salmon below the project, which might include rearing juveniles, or adults if the work continued past the work window into the adult migration period. Short-lived adverse effects, such as temporary increases in sediment and turbidity, as well as blasting of concrete into the water and instream activity, would have the potential to result in harm to SONC coho salmon and KMP steelhead. However, since construction would be limited to the immediate area near the dam and completed within one or two work seasons, these effects would not occur over either the spatial or temporal scales considered in this Opinion, thus the habitat indicators would be maintained (except for access), as shown in Table 5 below.

As with Alternatives One and Two, the proposed trap and haul facility would also degrade habitat access over the temporal scale considered in this Opinion (ten years). Based on the information in the BA regarding the design and function of this facility, NMFS is unable to conclude that it will provide adequate fish passage. As currently envisioned, the facility will continue to impact fish migration past the dam over the long term due to injury and mortality to adult SONC coho salmon and KMP steelhead related to trapping, hauling and handling, delays in migration and spawning related to trap and haul, displacement from historic spawning areas resulting from trap rejection or fall-back below the dam after transport, and harm associated with the fall-back and passage through the dam structures (diversion tunnel, spillway, trap). In addition, there would likely be harm to downstream juvenile migrants as they passed through the diversion tunnel, its weir structures and debris, and associated turbulence and obstructions.

It is conceivable that a trap and haul facility could be designed and operated in a way that would reduce impacts to listed fish to an acceptable level. However, such a facility would require a design that would accommodate flows of several thousand cfs, as well as labor-intensive operation, maintenance, and monitoring. The design of an adequate trap and haul facility for this site has not been initiated by the Corps. Because of the lack of a design and the challenges posed by the site, there is considerable uncertainty regarding how well the new trap and haul facility would protect listed SONC coho salmon and KMP steelhead.

As described above in section 1.5.2.1, the existing trap and haul facility has resulted in significant long-term harm to adult SONC coho salmon related to the above factors, which is likely to continue with the proposed trap and haul facility, though at a reduced level with the removal of the existing weir. The reduction in potential injury and mortality associated with the proposed facility as compared to the existing facility would result from the efficiency of the new velocity weir, which permits fish which might move above the weir during high water, or fish

passing downstream over the dam, to move unobstructed below the weir and not be trapped between the weir and dam. However, due to the uncertainty described in the paragraph above regarding the efficiency of the new trap and haul facility, and because NMFS must provide the benefit of the doubt to the listed species when such information gaps exist (USFWS and NMFS 1998), NMFS has no basis for assuming that the new trap and haul facility will function well or that it will reduce passage impacts to an acceptable level. Consequently, NMFS must conclude that the use of the new trap and haul, and the associated handling, transport, and dam-related impacts, would result in significant take of SONC coho salmon and KMP steelhead over both the short and long term and could result in the eventual extirpation of SONC coho salmon and KMP steelhead from Elk Creek.

Table 5. Summary checklist of environmental baseline and likely effects of construction of the new trap and haul facility proposed by COE (2000a) on relevant habitat indicators in the Elk Creek watershed over ten years (short-term refers to one year or less).

	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
PATHWAYS: INDICATORS	Properly[1] Functioning	At Risk[1]	Not Properly[1] Functioning	Restore[1]	Maintain[1]	Degrade[1]
Water Quality: Temperature		X			X	
Sediment		X			X	X short-term
Chem. Contamination	X				X	
Habitat Access: Physical Barriers			X			X
Habitat Elements: Substrate			X		X	
Large Woody Debris			X		X	
Pool Frequency			X		X	
Pool Quality			X		X	
Off-channel Habitat			X		X	
Refugia			X		X	
Channel Condition: Width/Depth Ratio			X		X	
Streambank Condition			X		X	
Floodplain Connectivity			X		X	
Flow/Hydrology: Peak/Base Flows		X			X	
Drainage Network Increase		X			X	
Watershed Conditions: Road Density/Location			X		X	
Disturbance History			X		X	
Riparian Reserves		X			X	

[1] These three categories of function (properly functioning, at risk, and not properly functioning) and the three effects (restore, maintain, and degrade) are defined for each indicator in NMFS (1996).

1.5.2.4. Dam Breaching

As shown in Table 1 above, Alternative Four for the proposed action is to partially remove Elk Creek Dam by completely removing the spillway structure and existing trap and haul facility, partial removal of the dam embankment on the south side, and restoration of about 5,000 feet of Elk Creek at the damsite to approximately its original alignment and gradient. Completion of this alternative is estimated to be completed by October 2003 (personal communication, Rock Peters, COE), thus the existing trap and haul would be used in the meantime. This proposed dam breaching would restore most of the habitat indicators over the spatial and temporal scale considered in this Opinion (Table 6).

Sediment and turbidity inputs to Elk Creek are likely to be increased by the project due to in-water, bank and floodplain work, but these should be limited to the short term. In addition, other short-term adverse effects to individual fish resulting from blasting of concrete into the water,

and instream activity are expected. These short-term adverse effects collectively have the potential to result in harm to SONC coho salmon and KMP steelhead both during and for a short time after the project. No adverse effects resulting from the proposed action are anticipated over the temporal scale considered in this Opinion (ten years); however, restoration of fish passage within the watershed is expected to result in long-term benefits to SONC coho salmon and KMP steelhead.

The removal of Elk Creek Dam from the stream channel is expected to result in restoration of in-channel habitat indicators (i.e., those that depend on hydrogeomorphic processes); e.g., the dam will no longer block the passage of large wood and sediment, thus these habitat indicators will be restored. In addition to removing the dam from the channel, Alternative Four of the proposed action includes restoration of approximately 5,000 feet of the channel through realignment of Elk Creek within the immediate damsite area to its original alignment and gradient, as well as placement of instream structures, further contributing to restoration of in-channel habitat indicators. Streambanks will also be restored within the project area (i.e., the 5,000 feet of Elk Creek channel) by revegetation and other erosion control measures, contributing to restoration of riparian vegetation and water quality (improved temperature) as well as instream habitat and channel condition.

In addition, if the work window is extended into mid-October to accommodate work needs, and if adult SONC coho salmon move up into the project area before mid-October, it is likely they would pass Elk Creek Dam via a pipe that will be carrying the stream through the work zone (the trap and haul would have been removed by then). While NMFS prefers to avoid any adverse effects associated with adult fish passing through a construction area in a pipe, extending the work window into October and completing the dam breaching in one construction season would be less harmful to SONC coho salmon than prolonging the breaching for a second season.

Table 6. Summary checklist of environmental baseline and effects of Elk Creek dam breaching on relevant habitat indicators in the Elk Creek watershed on relevant habitat indicators in the Elk Creek watershed over ten years (short-term refers to one year or less).

	ENVIRONMENTAL BASELINE			EFFECTS OF THE ACTION(S)		
PATHWAYS: INDICATORS	Properly[1] Functioning	At Risk[1]	Not Properly[1] Functioning	Restore[1]	Maintain[1]	Degrade[1]
Water Quality: Temperature		X		X		
Sediment		X		X		X short-term
Chem. Contamination	X				X	
Habitat Access: Physical Barriers			X	X		
Habitat Elements: Substrate			X	X		
Large Woody Debris			X	X		
Pool Frequency			X	X		
Pool Quality			X	X		
Off-channel Habitat			X	X		
Refugia			X	X		
Channel Condition: Width/Depth Ratio			X	X		
Streambank Condition			X	X		
Floodplain Connectivity			X	X		
Flow/Hydrology: Peak/Base Flows		X		X		
Drainage Network Increase		X			X	
Watershed Conditions: Road Density/Location			X		X	
Disturbance History			X		X	
Riparian Reserves		X		X		

[1] These three categories of function (properly functioning, at risk, and not properly functioning) and the three effects (restore, maintain, and degrade) are defined for each indicator in NMFS (1996).

1.5.2.5. Extension of Section 10 Permit

The current section 10 permit (Permit 1177) allowing the direct take of SONC coho salmon due to the operation of the existing trap and haul facility was issued on October 15, 1998, by NMFS, and expired on June 30, 2000 (NMFS 1998). The permit was extended to June 30, 2001, in a June 30, 2000, letter from NMFS. The section 7 consultation regarding the effects of granting the section 10 permit to the Corps was completed by NMFS on October 6, 1998. When NMFS issued the extension of the section 10 permit to June 30, 2001, reinitiation of consultation was not necessary because the extension did not constitute a significant change. NMFS is proposing to extend the section 10 permit to allow the existing trap and haul program to continue through 2003. This additional extension is considered a significant change, thus reinitiation of section 7 consultation is required. The reinitiation of consultation for the proposed extension is considered part of the proposed action addressed in this Opinion, thus the analysis of effects is incorporated into this Opinion in the following two paragraphs.

The effects of continuing to operate the existing trap and haul for the next ten years are described in section 1.5.2.1 above. The effects of extending the section 10 permit through 2003 are similar, but limited to 2001 through 2003. These effects include: (1) Some adults refuse to enter the trap and go back downstream (trap rejection), or are hauled upstream of the dam and then fall back through the dam and are injured or killed either in the diversion tunnel and/or in the weir; (2) during high flows the weir is often overtopped, allowing upstream migrating coho salmon adults to move above the weir, trapping them in the spill pool between the dam and weir, where they are likely to die; (3) migration of adult coho salmon is delayed by the trap and haul operation even when it runs smoothly, compared to natural conditions; (4) injury occurs in the trap and/or during hauling and handling; (5) spawning may be disrupted or displaced due to transport; (6) downstream migrating juveniles may be impinged on debris that clogs the diversion tunnel and weir during high spring flows, which may result in injury or death; and (7) debris carried by high flows may knock down or otherwise damage the weir, allowing adults to swim up into the tailrace where they are unable to spawn or continue migrating upstream.

In addition to conducting the trap and haul program through 2003, the Corps will monitor the natural production of threatened SONC coho salmon upstream of Elk Creek Dam using snorkel surveys and adult carcass surveys during this time period. Direct observation is the least disruptive and simplest method for determining presence/absence of the species and estimating the relative abundance. Typically, a cautious observer is effective in obtaining data without disrupting the normal behavior of a fish. Fry and juveniles frightened by the water turbulence and sound created by observers are likely to seek temporary refuge behind rocks, vegetation, and deep water areas. In extreme cases, some individuals may temporarily leave the particular pool or habitat type when observers are in their area. Harassment is the primary form of take associated with these direct observation activities and no mortalities are anticipated to occur. During proposed instream passive surveys, fish disturbance is minimized by moving through the stream slowly thus allowing ample time for fish to reach escape cover. Redds may be visually inspected, but no redds will be walked on. ESA-listed fish carcasses will be collected and examined for evidence of spawning and immediately returned to the stream. The collection of threatened SONC coho salmon carcasses is not expected to have more than short-term adverse effects on the population of the species or the species as a whole because the adult fish will have completed their life cycles.

1.5.3. Critical Habitat

SONC coho salmon critical habitat was designated May 5, 1999 (64 FR 24049). SONC coho salmon critical habitat encompasses accessible reaches of all rivers (including estuarine areas and tributaries) between the Mattole River in California and the Elk River in Oregon, including all waterways and substrate below longstanding, naturally impassable barriers (i.e., natural waterfalls in existence for at least several hundred years). Because the critical habitat is inclusive of the Elk Creek project action area, and the above description of the effects of the proposed action includes habitat effects, a separate description of the effects of the project on critical habitat here is not necessary. In addition, since KMP steelhead occupy essentially the same habitats as SONC coho salmon, any discussion of SONC coho salmon critical habitat or effects of the alternatives on that habitat is considered applicable to KMP steelhead.

1.5.4. Cumulative Effects

“Cumulative effects" are defined in 50 CFR 402.02 as those effects of "future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation.” The “action area” is defined as “all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." (50 CFR 402.02.) The “action area” is defined as “all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action.” (50 CFR 402.02). Physical activities associated with all four alternatives, such as operating the trap and hauling fish around the dam (or breaching the dam) encompass the immediate area around Elk Creek Dam and the road between the Rogue River and the dam along lower Elk Creek. In addition, because of the location of the dam less than three miles from the mouth of Elk Creek (i.e., below all fish-bearing tributaries of Elk Creek) and the dam’s effects on fish passage, all four alternatives affect the entire watershed because they influence fish passage to and from spawning habitat in the mainstem of Elk Creek and its tributaries.

Historically, agriculture, livestock grazing, forestry and other activities on non-federal land in the Upper Rogue River Basin have contributed substantially to temperature and sediment problems in this area’s SONC coho salmon habitat, as well as habitat for other salmonids. This is true of the Elk Creek watershed, primarily due to a high percentage of non-Federal land at lower elevations, high road densities, water withdrawals and other development related activities. Conditions on and activities within non-Federal riparian areas along stream reaches downstream of the Federal land presently exert a greater influence on river temperatures and probably contribute more sediment to the habitat of SONC coho salmon and KMP steelhead in the Elk Creek subbasin than the upstream Federal land management effects.

Significant improvement in reproductive success of SONC coho salmon or KMP steelhead outside of Federal land is unlikely without changes in agricultural, forestry, and other practices occurring within non-Federal riparian areas in the Elk Creek watershed. NMFS is not aware of any future new (or changes to existing) State and private activities within the action area that would cause greater impacts to listed species than presently occurs. In fact, now that SONC coho salmon are listed as threatened and KMP steelhead are listed as candidates, NMFS assumes that non-Federal land owners will take steps to curtail or avoid land management practices that would potentially result in take of these species. For actions on non-Federal lands which the landowner or administering non-Federal agency believes are likely to result in adverse effects to SONC coho salmon or KMP steelhead or their habitat, the landowner or agency should work with NMFS to obtain the appropriate ESA section 10 incidental take permit, which requires development and submission of a habitat conservation plan. If a take permit is requested, NMFS would likely seek project modifications to avoid or minimize adverse effects and taking of listed fish. Until improvements in non-Federal land management practices are actually implemented, NMFS assumes that future private and State actions will continue in similar ways and intensities as in recent years.

1.6. Conclusion

As described in Section 1.5.1, the effects of the proposed alternatives on habitat indicators at the appropriate spatial (Elk Creek watershed) and temporal (ten years) scales form the basis of the jeopardy/no jeopardy determination in this Opinion. The conclusions with regard to the questions of jeopardy and adverse modification/destruction of critical habitat for the four proposed alternatives are given below.

1.6.1. Existing Trap and Haul Facility

Implementation of Alternative One (continued use of the existing trap and haul facility for the next ten years) is likely to jeopardize the continued existence of SONC coho salmon and KMP steelhead within the Elk Creek Basin due to the biological effects of inadequate fish passage at the spatial and temporal scales considered in this Opinion. I.e., operation of the existing trap and haul facility over the short-term (through 2003) is not likely to jeopardize SONC coho salmon and KMP steelhead, but long-term operation of the facility is likely to jeopardize these species. NMFS used the best available scientific and commercial data to determine the effects of the proposed action on the biological requirements of the species relative to the environmental baseline, together with cumulative effects. NMFS applied its evaluation methodology (NMFS 1996) to the proposed action and found that it would continue to degrade habitat access due to inadequate fish passage over the long term (Table 3). Thus this proposed alternative reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of SONC coho salmon and KMP steelhead in the Elk Creek watershed by reducing the reproduction, numbers, or distribution of that species, through continued project-induced mortality, injury, and other harm such as migration delay and spawning displacement.

The action, however, is not likely to result in degradation of SONC coho salmon designated critical habitat or KMP steelhead habitat at the spatial and temporal scales considered in this Opinion (Table 3). While the presence of the dam in the stream channel disrupts in-channel habitat processes, these disruptions do not occur at the scale of the Elk Creek watershed, nor does this alternative proposed to cause any additional habitat disturbance.

1.6.2. Existing Diversion Tunnel

Implementation of Alternative Two (use of existing diversion tunnel as sole means of fish passage for the next ten years starting in 2001) is likely to jeopardize the continued existence of SONC coho salmon and KMP steelhead within the Elk Creek Basin due to the biological effects of inadequate fish passage at the spatial and temporal scales considered in this Opinion. NMFS used the best available scientific and commercial data to determine the effects of the proposed action on the biological requirements of the species relative to the environmental baseline, together with cumulative effects. NMFS applied its evaluation methodology (NMFS 1996) to the proposed action and found that it would continue to degrade habitat access due to inadequate fish passage over the long term (Table 4). Thus this proposed alternative reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of SONC coho salmon and KMP steelhead in the Elk Creek watershed by reducing the reproduction, numbers, or distribution of that species, through continued project-induced mortality, injury, and other harm such as migration delay and spawning displacement. The use of the diversion tunnel as the sole means of permitting upstream migration of adult SONC coho salmon and KMP steelhead will likely eliminate the Elk Creek populations, since access through the dam is not possible for most adult migrants.

The action, however, is not likely to result in degradation of SONC coho salmon designated critical habitat or KMP steelhead habitat at the spatial and temporal scales considered in this Opinion (Table 4). While the presence of the dam in the stream channel disrupts in-channel habitat processes, these disruptions do not occur at the scale of the Elk Creek watershed, nor does this alternative proposed to cause any additional habitat disturbance.

1.6.3. New Trap and Haul Facility

Implementation of Alternative Three (building a new trap and haul facility, with operation starting in 2005, and using the existing trap and haul in the meantime) is likely to jeopardize the continued existence of SONC coho salmon and KMP steelhead within the Elk Creek Basin due to the biological effects of inadequate fish passage at the spatial and temporal scales considered in this Opinion. These effects are due to the continued use of the existing trap and haul through 2004, as well as the effects of the new trap and haul facility over the long-term. NMFS used the best available scientific and commercial data to determine the effects of the proposed action on the biological requirements of the species relative to the environmental baseline, together with cumulative effects. NMFS applied its evaluation methodology (NMFS 1996) to the proposed action and found that it would continue to degrade habitat access due to inadequate fish passage over the long term (Table 5). Thus this proposed alternative reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of SONC coho salmon and KMP steelhead in the Elk Creek watershed by reducing the reproduction, numbers, or distribution of that species, through continued project-induced mortality, injury, and other harm such as migration delay and spawning displacement.

The action, however, is not likely to result in degradation of SONC coho salmon designated critical habitat or KMP steelhead habitat at the spatial and temporal scales considered in this Opinion (Table 5). While the presence of the dam in the stream channel disrupts in-channel habitat processes, these disruptions do not occur at the scale of the Elk Creek watershed. This alternative would cause minor additional habitat disturbance during the removal of the existing trap and haul facility and construction of the new facility, but these effects would be far smaller than the spatial and temporal scales considered in this Opinion.

1.6.4. Dam Breaching

Implementation of Alternative Four of the proposed action (breaching of the uncompleted Elk Creek Dam, with completion of the fish passage corridor in 2003, and using the existing trap and haul in the meantime) is not likely to jeopardize the continued existence of SONC coho salmon or KMP steelhead, or result in the destruction or adverse modification of SONC coho salmon designated critical habitat or KMP steelhead habitat. The continued operation of the existing trap and haul for only another two years, with permanent replacement in 2003 by a restored Elk Creek channel, is the basis for this determination. NMFS used the best available scientific and commercial data to apply its jeopardy analysis when analyzing the effects of the proposed action on the biological requirements of the species relative to the environmental baseline, together with cumulative effects. NMFS applied its evaluation methodology (NMFS 1996) to the proposed action and found that the only impact to SONC coho salmon and KMP steelhead would be minor and temporary sediment impacts, but at spatial and temporal scales far less than those considered in this Opinion (Table 6). Nevertheless, these impacts may adversely affect individual SONC coho salmon and KMP steelhead during in-water work, and thus constitute incidental take. The proposed action will restore fish passage and aquatic habitat in the Elk Creek watershed over the next ten years, and significantly benefit SONC coho salmon and its designated critical habitat and KMP steelhead and their associated habitat in Elk Creek.

1.6.5. Extension of Section 10 permit

The proposed extension of the section 10 permit by NMFS through 2003 will allow for the continued trap and haul of SONC coho salmon and KMP steelhead while a permanent solution to the fish passage problems at Elk Creek is being implemented. The short-term operation of the existing trap and haul is not likely to jeopardize the continued existence of SONC coho salmon, but the long-term operation of this facility crosses the jeopardy threshold for the reasons described in 5.2.1 above. Thus NMFS finds that the extension of the section 10 permit (Permit 1177) through 2003 for an annual take of adult and juvenile SONC coho salmon associated with the Corps' scientific research and enhancement activities is not likely to jeopardize the continued existence of the species or result in the destruction or adverse modification of the species' designated critical habitat.

1.7. Reinitiation of Consultation

Consultation must be reinitiated if: The amount or extent of taking specified in the Incidental Take Statement is exceeded, or is expected to be exceeded; new information reveals effects of the action may affect the listed species in a way not previously considered; the action is modified in a way that causes an effect on the listed species that was not previously considered; or, a new species is listed or critical habitat is designated that may be affected by the action (50 C.F.R. 402.16).

2. INCIDENTAL TAKE STATEMENT

As described in section 6 above (Conclusions), Alternatives One, Two, and Three proposed by the Corps are likely to jeopardize the continued existence of listed SONC coho salmon (and candidate KMP steelhead). However, Alternative Four is not likely to jeopardize either species, thus this Opinion does not contain a Reasonable and Prudent Alternative (RPA); i.e., Alternative Four is itself an RPA because it would avoid jeopardy. The incidental take statement below is for the implementation of Alternative Four only by the Corps. The incidental take permit does not contain any measures regarding the extension of the section 10 permit by NMFS.

Sections 4(d) and 9 of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. Harass is defined as actions that create the likelihood of injuring listed species to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. Incidental take is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of Section 7(b)(4) and Section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The measures described below are non-discretionary; they must be implemented by the action agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The COE has a continuing duty to regulate the activity covered in this incidental take statement. If the COE: (1) Fails to

adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document; and/or (2) fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures. Incidental takings resulting from the agency action, including incidental takings caused by activities authorized by the agency, are exempted from the taking prohibition by section 7(o) of the ESA, but only if those takings are in compliance with the specified terms and conditions.

2.1. Amount or Extent of the Take

NMFS anticipates that Alternative Four has more than a negligible likelihood of resulting in incidental take of SONC coho salmon because of detrimental effects on suspended sediment levels and the potential for direct incidental take during blasting and in-water work. Effects of management actions such as these are largely unquantifiable in the short term, and are not expected to be measurable as long-term effects on the species' habitat or population levels. Therefore, even though NMFS expects some low level incidental take to occur due to the actions covered by this Opinion, the best scientific and commercial data available are not sufficient to enable NMFS to estimate a specific amount of incidental take to the species itself. In instances such as these, the NMFS designates the expected level of take as "unquantifiable." Based on the information in the BA, NMFS anticipates that an unquantifiable amount of incidental take could occur as a result of the dam breaching proposed action.

2.2. Reasonable and Prudent Measures

NMFS believes that the following reasonable and prudent measures are necessary and appropriate to minimize the incidental take of SONC coho salmon due to the breaching of Elk Creek Dam:

1. After breaching has been funded and approved, convene an Environmental Coordination Task Force (ECTF) to advise the Corps before, during and after the construction phase of the breaching of Elk Creek Dam on actions to reduce impacts of the project on SONC coho salmon based on available and relevant information and data collected from the monitoring described below.

2. Monitor channel morphology, sediment, and water quality before, during, and after the construction phase of the dam breaching to provide data that will enable the ECTF to determine if further actions are necessary to reduce impacts to reduce impacts of the project on SONC coho salmon.

3. Collect data on fish distribution and abundance in the action area prior to the dam breaching, and conduct studies to determine the response of SONC coho salmon to altered conditions in the Elk Creek watershed during and after dam breaching. As with

measure #2, this measure will provide data enabling the ECTF to determine if further actions are necessary to reduce impacts of the project on SONC coho salmon.

4. Report on the progress in implementing the terms and conditions specified below.

2.3. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the Corps must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1a. Establish an Environmental Coordination Task Force (ECTF) consisting of federal and state regulatory and resource agency representatives from NMFS, USFWS, Oregon Department of Fish and Wildlife, Rogue River National Forest, Medford District of the Bureau of Land Management, the Corps, and possibly others, to assist the Corps in planning, implementing, and reviewing monitoring studies, and to advise the Corps on actions to reduce impacts of the breaching of Elk Creek Dam. Coordinate meetings of the ECTF as needed to meet these objectives.

1b. Convene the ECTF at least quarterly, or more often if new information warrants, during the construction period for the dam breaching project, beginning several months before project construction begins and continuing at least one year after project construction is completed.

2a. A channel morphology and sediment monitoring plan detailing methods and duration must be completed, coordinated with the ECTF, and approved by NMFS no less than three months before construction begins. Monitoring will provide data for analyzing the response of the Elk Creek channel to project implementation and determining corrective actions if unexpected effects to anadromous salmonid habitat are being caused by any aspect of the project.

2b. During the construction phase of the project, monitor turbidity in Elk Creek 100 feet above and below the work every four hours during in-water work, and for a period of two weeks following the last in-water work. Any activity causing turbidity in exceedance of 10% greater than background turbidity shall be immediately modified to reduce turbidity. If turbidity in exceedance of 10% greater than background occurs, the monitoring frequency shall be every two hours until the problem is resolved. Following construction, turbidity shall be monitored in Elk Creek above and below the project to help differentiate turbidity attributable to the watershed above the project versus that from the project.

3a. Coordinate an informal review by the ECTF of the extent and methods of ODFW's ongoing studies on SONC coho salmon distribution and abundance in the Elk Creek watershed to ensure that the most useful pre-breaching data will be collected, and implement any resulting ECTF recommendations on pre-breaching data collection.

3b. Consistent with 3a above, a plan for monitoring SONC coho salmon distribution and abundance during and after the dam breaching must be completed, coordinated with the

ECTF, and approved by NMFS no less than three months before construction begins. Monitoring will provide data for analyzing the response of the Elk Creek population of SONC coho salmon to project implementation, and determining corrective actions if unexpected effects are being caused by any aspect of the project.

4a. Prepare quarterly monitoring, annual progress, and final project reports of progress on the implementation of each Term and Condition in this Opinion. Annual reports shall be provided to NMFS by January 31 of each year after the project construction begins, and continuing at least two years beyond project completion. The annual reports should be sent to NMFS at the addresses below:

Oregon Branch Chief
Habitat Conservation Division
National Marine Fisheries Service
525 NE Oregon Street, Suite 500
Portland, Oregon 97232-2778

In addition to NMFS, copies of reports should also be provided to members of the ECTF.

3. MAGNUSON-STEVENS ACT

Public Law 104-267, the Sustainable Fisheries Act of 1996, amended the Magnuson-Stevens Fishery Conservation and Management Act (Magnuson-Stevens Act) to establish new requirements for "Essential Fish Habitat" (EFH) in Federal fishery management plans and to require Federal agencies to consult with NMFS on activities that may adversely affect EFH. "EFH" means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (Magnuson-Stevens Act §3). The Council has completed an EFH designation for the Pacific salmon fishery (PFMC 1999; Secretarial Approval, September 27, 2000), which includes coho salmon and chinook salmon originating in the Rogue River Basin, including Elk Creek. EFH includes those waters and substrate necessary to ensure the production needed to support a long-term sustainable fishery (*i.e.*, properly functioning habitat conditions necessary for the long term survival of the species through the full range of environmental variation).

The Magnuson-Stevens Act requires consultation for all actions that may adversely affect EFH, and it does not distinguish between actions in EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and upslope activities that may have an adverse effect on EFH. Therefore, EFH consultation with NMFS is required by Federal agencies undertaking, permitting or funding activities that may adversely affect EFH, regardless of its location.

The consultation requirements of section 305(b) of the Magnuson-Stevens Act (16 U.S.C. 1855(b)) provide that:

- Federal agencies must consult with NMFS on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH;
- NMFS shall provide conservation recommendations for any Federal or State activity that may adversely affect EFH;

- Federal agencies shall within 30 days after receiving conservation recommendations from NMFS provide a detailed response in writing to NMFS regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NMFS, the Federal agency shall explain its reasons for not following the recommendations.

3.1. Identification of Essential Fish Habitat

The Rogue River and its accessible tributaries constitute freshwater EFH for coho salmon and chinook salmon (PFMC 1999). The estuarine and marine extent of coho salmon and chinook salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (340.4 km) offshore of Washington, Oregon, and California north of Point Conception (PFMC 1999). Salmon EFH excludes areas upstream of longstanding naturally impassable barriers (i.e., natural waterfalls in existence for several hundred years).

3.2. Proposed Action

The proposed action, described as four alternatives, is detailed above, in the BA (COE 2000a), and in the draft Elk Creek Lake Fish Passage Corridor Project Modifications (COE 1999), but in summary are: (1) Existing Trap and Haul Facility, (2) Diversion Tunnel, (3) New Trap and Haul Facility, and, (4) Dam Breaching. The proposed action area for all the alternatives encompasses the area around the existing Elk Creek Dam, including all accessible habitat in Elk Creek upstream of the dam, and downstream within Elk Creek and the Rogue River to the Pacific Ocean. The proposed action includes the extension of the section 10 permit for the operation of the existing trap and haul facility from June 30, 2001, through 2003. A detailed description and identification of EFH for Pacific salmon is found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of the impacts to these species' EFH from the above proposed COE actions are based on this information.

The objective of this EFH consultation is to determine whether the proposed actions may adversely affect EFH for coho salmon and chinook salmon. Another objective of this EFH consultation is to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse impacts to EFH resulting from the proposed actions.

3.2.1. Effects of the Proposed Action (Alternatives)

3.2.1.1. Existing Trap and Haul Facility

There will be no new effects to EFH from retaining this facility at its current location over the long-term. Effects from the existence and operation of the existing facility are likely on juvenile and adult migration, components of EFH for both coho and chinook salmon. Even though a trap and haul program is in effect, the existence of the dam and the effects associated with the trap and haul constitute significant alteration of EFH relative to migration corridors for coho and chinook salmon.

3.2.1.2. Diversion Tunnel

There will be no new effects to EFH from retaining this facility at its current location over the long-term. Use of the existing tunnel as sole fish passage past the dam would result in inadequate fish passage conditions for coho and chinook salmon. Turbulence, debris and tunnel structure would contribute to juvenile coho and chinook salmon risk as they passed downstream through the tunnel, and would completely block any upstream movement of these life stages. Upstream migration of adult coho and chinook salmon would be prevented as a result of flow velocities under most flow regimes through the tunnel, thus preventing upstream use of habitats for spawning, breeding or rearing. The dam and the effects associated with the tunnel constitute significant alteration of EFH relative to migration for coho and chinook salmon.

3.2.1.3. New Trap and Haul Facility

Effects to EFH from this alternative will likely result from removing the existing trap and haul facility and constructing a new facility in its place, and from the new facility operation. In total, the new facility will duplicate the juvenile and adult migration effects associated with the existing facility, but somewhat reduce direct effects to the species from trapping and hauling, thereby slightly improving migration EFH. There will be local and downstream effects to juvenile rearing EFH associated with instream construction activities. Since construction will take place in a dry channel resulting from bypassing Elk Creek, effects will likely be in the form of delayed sediment/turbidity effects once flow is reestablished in Elk Creek at the construction site. Even though a new trap and haul program will be in effect, the existence of the dam and the effects associated with the trap and haul would constitute significant alteration of EFH relative to migration corridors for coho and chinook salmon.

3.2.1.4. Dam Breaching

There will be minor negative and significant positive effects on all four components of EFH from this alternative. Initial minor effects will be associated with the existing trap and haul facility removal, dam breaching and channel reconfiguring and restoration. However, with the proposed stream bypass dewatering the work area during construction, direct effects to salmon will be minimized. Salmon in the construction area will likely not be affected by the activity as the bypass will exclude them from the area. As the stream channel is reactivated after construction, however, a minor sediment and turbidity plume can be expected which may have adverse effects on salmon below the project.

3.2.1.5. Extension of Section 10 Permit

There will be no new effects to EFH from retaining this facility at its current location over the short-term. Effects from the existence and operation of the existing facility are likely on juvenile and adult migration, components of EFH for both coho and chinook salmon. Even though a trap and haul program is in effect, the existence of the dam and the effects associated with the trap and haul constitute significant alteration of EFH relative to migration corridors for coho and chinook salmon.

NMFS believes that the potential impacts from the proposed action include increased turbidity and loss of benthic food sources resulting from dredging and disposal of dredged material (Morton 1977). Turbidity, at moderate levels, has the potential to adversely affect primary and secondary productivity, and at high levels, has the potential to injure and kill adult and juvenile

fish, and may also interfere with feeding (Spence *et al*. 1996). Behavioral effects on fish, such as gill flaring and feeding changes, have been observed in response to pulses of suspended sediment (Berg and Northcote 1985). Fine redeposited sediments also have the potential to adversely affect primary and secondary productivity (Spence *et al*. 1996). Benthic resources will be temporarily lost as a result of channel realignment. However, recolonization of these resources is rapid and will not create undue effects on the species of concern.

3.3. Conclusion

The NMFS believes that the proposed alternatives may adversely affect designated EFH for coho and chinook salmon.

3.4. EFH Conservation Recommendations

Conservation recommendations are required to mitigate adverse affects associated with the proposed alternatives. Due to adverse affects to coho and chinook salmon and inadequate provisions for fish passage, the New Trap and Haul Facility, Existing Trap and Haul Facility and the Diversion Tunnel alternatives cannot be mitigated through conservation recommendations. As a result, the NMFS recommends that these alternatives not be considered as viable alternatives.

The Dam Breaching alternative will create adverse affects for coho and chinook salmon. The proposed RPMs, however, provide appropriate conservation recommendations to mitigate effects. These include:

1. Construction-related effects to coho and chinook salmon present in the action area must be minimized by following accepted best management practices. These include, but are not limited to: Working within the approved work window, as appropriate; diverting Elk Creek around the construction site during in-channel work; maintaining minimum flows sufficient for downstream juvenile fish passage; minimizing sediment production from the construction site and introduction into Elk Creek; and, maintaining turbidity below stipulated levels of 10% above natural levels.
2. Monitor coho and chinook salmon habitat and populations in the action area and above the removal site during and after the breaching of Elk Creek Dam. The information gathered will provide NMFS with sufficient information to judge whether the dam breaching has removed impediments to passage and permitted utilization of available spawning, breeding, rearing and feeding habitat. In addition, monitoring will provide NMFS with information necessary to determine the population response to increased passage and use of habitat.

3.5. Statutory Requirements

The Magnuson-Stevens Act and Federal regulations (50 CFR Section 600.920) to implement the EFH provisions require Federal action agencies to provide a written response to EFH Conservation Recommendations within 30 days of receipt. The final response must include a description of measures proposed to avoid, mitigate, or offset the adverse impacts of the activity. If the response is inconsistent with the EFH Conservation Recommendations, an explanation of the reasons for not implementing them must be included.

3.6. Consultation Renewal

The Corps must reinitiate EFH consultation with NMFS if the selected alternative is substantially revised or if new information becomes available that affects the basis for any NMFS' EFH conservation recommendations (50 CFR Section 600.920).

4. LITERATURE CITED

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